peculiarly susceptible and older children not at all or only rarely liable.

If, as the writer believes, these cases are not true or modified rubella, it is important that the existence of a pseudo-rubellous affection of young infants should be recognized, and by reason of its non-contagiousness should not be subjected to the quarantine that properly is enforced by health authorities against true rubella.

CLASSIFICATION OF RALES: A PLEA FOR SIMPLIFICATION.

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The writer has taught physical diagnosis for many years. He is impressed with the difficulties encountered in teaching students to identify the adventitious sounds heard in auscultation, commonly called *rales*. He has examined most of the text-books in use in the leading American universities and finds an astounding divergence in the matter of nomenclature. The variation, so far as the student is concerned, depends to a very great extent on the early educational environment of his teachers or of those who have written the text-books that are put into his hands for study.

It is quite desirable that the student come into contact with men who have themselves been taught in different schools. This gives the student a little broader grasp of his subject than he would get otherwise. However in respect to this part of the nomenclature of physical diagnosis the difference in teachers may bring confusion to the student.

Seldom do we find two authors whose classification is the same. Every writer has apparently been conscious of the difficulty and has tried to make a classification which will clarify the situation. They have all failed to do this. My own effort may meet with the same failure, but if calling attention to the difficulty may result in some sort of coördinated effort to remove obstacles for the medical student I shall be content.

He may be spared the supreme memory effort of mastering such a list as the following, taken from the authors I have had at hand: Dry, moist, sonorous, sibilant, mucous, submucous, crepitant, subcrepitant, wheezing, whooping, mucous click, crowing, whistling, piping, squeaking, hissing, humming, high-pitched crackling, bubbling, small bubbling, gurgling, snapping, musical, coarse, fine, resonant, non-resonant, consonating, non-consonating, flapping, cardiopneumatic, laryngeal, tracheal, cavernous, euphonic, pleural, vesicular, latent, crumpling, crackling, metallic groaning, hollow, metallic tinkling (*Gutta cadens*), bronchopulmonary, fistula rale, crepitous, indeterminate, frémissement cataire, Hippocratic succussion.

Our first classification came from Laennec, as we all are aware, and it is today superior to the classifications found in most of the text-books. He did not use the word *rale* but the French word *rhonchus*. I quote from the translation by Forbes[1]—Rhonchi (rales).

1. Moist crepitus rhonchus or crepitation (very large).
2. Mucous rhonchus or *gurgling* (large, middling, small).
3. Dry, sonorous rhonchus or snoring.
4. Dry, sibilous rhonchus or whistling.
5. Dry, crepitous rhonchus, with large bubbles or crackling.

Those who came after Laennec in their effort to supplement and clarify the work of the master have gone further and produced the almost Rabalaisian collection I have mentioned above.

Professor G. Andral in his notes on the fourth and latest French edition of Laennec has the following to say regarding rhonchi (rales): "Since Laennec hardly anything has been added to the excellent description given by him of the different rhonchi." Surely it is commendable that study of such an important contribution should go on, that a form should be determined and some sort of agreement reached as to terminology to which we shall all agree. It is within the province of constituted medical associations to aid in clarifying matters of this kind.

It would seem important that medical men who speak the English tongue adopt a standard terminology.

The diagnostic value of the signs and the importance of their differentiation are not to be gainsaid. Who will deny that the determination of a different type of rale speaks for a difference in pathology? Yet how frequent is it that we read in medical papers, "Rales were found at the base?" The authors who write thus evidently are choosing words which all understand and prefer not to enter a discussion as to classification. Perhaps they are wise.

In a survey of the literature we find two tendencies. One school, among which that of Austin Flint[2] stands out conspicuously, has attempted to establish a nomenclature based on anatomical considerations. Austin Flint's classification is as follows: Laryngeal and tracheal rales; bronchial rales; vesicular rales; cavernous rales; pleural rales; indeterminate rales.

Flint uses the term "so-called" as applied to the *subcrepitant* rale in the chapter on classification of rales and attributes great diagnostic importance to this rale. One gets the impression that he accepts the term against his will. Indeed, his idea in departing from Laennec's original classification is set forth on page 140, "The term *subcrepitant* gives rise to confusion and there is no advantage in retaining it as the name of a distinct sign. Very fine bubbling expresses more correctly the characters of the sign. The moist rales are often called *mucous rales.* The name is obviously inappropriate, since not only are the sounds produced by other liquids than mucus, but other liquids are best suited for their production, especially in the large and medium sized tubes."

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[1] A Treatise on the Diseases of the Chest and on Mediate Auscultation, by R. T. H. Laennec, M.D., 3d French edition. Trans. by John Forbes. Samuel S. and Wm. Wood, 1838.

[2] Auscultation and Percussion, 6th edition. Lea & Febiger, 1912.

One of the difficulties in classification comes from the limitation of the words "mucous rales." If we take it in the narrow sense of a rale produced by a mucous liquid, all that Flint says is true. However if we consider the word as applying to a rale produced in a tube lined with mucous membrane we are justified, perhaps, in preserving it. Flint's subclasses describe vividly the acoustic qualities used by Laennec's *sonorous* and *sibilant.* Yet he avoids the words.

Da Costa the elder[3] uses a strictly anatomical classification: Bronchial; vesicular; cavity.

His subclasses are made by acoustic qualities and are of the simplest. All of the types of Laennec's main headings are here preserved, namely, *sonorous, sibilant, mucous, crepitant.*

The younger Da Costa[4] puts forth a classification based partly on anatomical and partly on auditory qualities. This is fatal to understanding and to good pedagogics. Here, in the writer's opinion, is the source of most of the confusion which exists.

We have another classification which is partly based upon the physical properties of the apparatus producing the sound and partly on the auditory perception of the sound itself.

In explanation of dry rales Sahli[5] says they may have their origin in *viscid fluid.* This shows how artificial is the term and impossible from the standpoint of clearness. In justification of the term "bubbling," Sahli says: "The term 'bubbling' was employed because it was formerly supposed that moist rales arose from the bursting of air-bubbles in fluid secretion. Of course, we know now that the contents of the bronchi are not sufficiently fluid for such an explanation, and so we suppose that the rales arise from *membranes* of *secretion* being formed in the bronchial lumen and then torn apart again, partly by movement of the air and partly by movement of the lungs." If the term *moist* does not mean moisture or fluidity of tube content, if a dry rale may have its origin in *viscid fluid* are we justified in further burdening medical literature with either of these terms?

Norris and Landis[6] say in explanation of a classification purely auditory in character: (Sonorous; sibilant; crepitant; subcrepitant; bubbling.) "Genetically all rales are moist but sometimes they are classified as 'moist' and 'dry.' These are undesirable terms, however, and should not be used. Further, the term 'dry' as applied to rales seems paradoxical, for it is impossible to conceive of a 'rale' that does not, to some extent at least, depend on moisture or increased turgescence for its causation."

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[3] Medical Diagnosis, 1898. J. B. Lippincott & Co.

[4] Principles and Practice of Physical Diagnosis, 4th edition. W. B. Saunders Company, Philadelphia, 1919.

[5] Treatise on Diagnostic Methods, Trans., 4th German ed. Kinnicutt & Potter, 1905, W. B. Saunders Company.

[6] Diseases of the Chest and the Principles of Physical Diagnosis. W. B. Saunders Company.

I heartily agree with this conclusion.

Upon the classification moist or dry, Latham[7] makes this illuminating statement: "Call it *rale* or *rattle* or *crepitation* or what you will, but pray do not add 'mucous' to it by way of specific difference, for this term must always imply that the sound is produced by air passing through mucus whereas it is produced equally by air passing through mucus, blood or any fluid whatever. Besides, it is beyond the truth to say that the quality of the fluid through which the air passes can be distinguished by the quality of the sound that results. The sound will indicate the situation and quantity of the fluid and no more."

We are indeed fortunate for this, for most of us believe that the situation and quantity of the fluid may be estimated by the extent and quality of the rales heard after our ears are trained to recognize them. In listening and learning we must teach our students to see the structure of the region examined and to picture the mechanism of the production of the rale heard rather than to identify a certain auditory quality for which he must endeavor to find a name. If we insist on an anatomical classification this power will come to the student.

Richard Cabot[8] has departed furthest from the classic nomenclature of Laennec. He has done this without utilizing the anatomical classification of Flint. All of the classical terminology has been abandoned with the exception of *crepitant*. Nowhere do we see mention of *mucous*, *subcrepitant*, *sonorous* or *sibilant*—terms certainly as worthy as *bubbling*, *crackling* and *musical*. Cabot even mentions "complicated chords from rales which vary in pitch." One reads and fears that tomorrow may bring forth the necessity of adding harmonics to an already full junior year.

Of all the authors cited, Sam J. Gee[9] has, perhaps, adhered more closely to the original of Laennec in the matter of classification. In his foreword he says: "The sense of words has not been perverted nor have new words been introduced to denote signs already well denominated. Much of the difficulty of teaching auscultation and percussion to students is due to neglect of these plain rules." Gee utilizes but four categories: Crepitant; mucous; sonorous and sibilant; doubtful.

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[7] Lectures on Subjects Connected with Clinical Medicine. Philadelphia, Borrington, 1847.

[8] Physical Diagnosis, 6th edition. Wm. Wood & Co., 1915.

[9] Auscultation and Percussion, 6th ed., London.

In starting out to write this paper I was thoroughly convinced that any departure from the classical terminology was to be deplored. Since examining and tabulating the classifications from various sources I am convinced that there is no need to sacrifice the advantages of an anatomical classification to this end. If we take three simple heads: (1) Crepitant or vesicular; (2) mucous or tube; and (3) cavernous we shall be able to place every rale we hear excepting pleuritic friction sounds, which are perhaps best excluded from this category.

It may be that I may be charged with perverting the meaning of the word "mucous." It is surely within a tube lined with mucous membrane that these rales have their origin. Whether fluid or tenacious, the basis of the mechanism which produces them is mucous; whether they are due to turgescence of the lining of the tube, or to muscular contraction in the wall, our term applies. We can utilize the classical *subcrepitant* and the onomatopoetic pair *sonorous* and *sibilant* as subdivisions of the *mucous*. Nearly all of the half a hundred of varieties described by the authors named and others would be subvarieties of the mucous rale.

Of the other two, one (*crepitant*) stands alone and needs no comment or word of explanation. The other (*cavernous*) I should perhaps include within the category of mucous rale also. This would be a further and a desirable simplification. We should then have but two categories: (1) Vesicular or crepitant rales; (2) tube or mucous rales. This shortening involves no departure from Laennec's form other than placing *sonorous* and *sibilant* as subheads of mucous and the addition of the corresponding anatomical words.

I feel sure that teachers and students would rejoice if but two great classes of rales were to be remembered.

THE DIAGNOSIS OF PRIMARY LUNG TUMORS.[1]

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Until comparatively recently the lungs have been an unexplored surgical domain. Improvement in method of anesthesia and in the technic of thoracic surgery have enabled the surgeon to invade the lungs with rapidly increasing success. The time is not far off when thoracic surgery will be just as common and the thorax invaded by the surgeon with the same ease as the abdomen is today. The development of this hitherto untrodden surgical field imposes upon the internist the duty of recognizing intrathoracic lesions that

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[1] Read at a meeting of the Yorkville Medical Society, February 20, 1920.